IFW
AF

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: ROBERT RASMUSSEN JIANPING YANG	Examiner: A. Piziali
Serial No.: 09/589,055	Group Art Unit: 1775
Filed: June 7, 2000	Att'y Docket: 2008.002800
For: Method for Binding Phosphor Particles in a Field Emission Display Device	Customer No. 023720

APPEAL BRIEF

CERTIFICATE OF MAILING
37 C.F.R. 1.8

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date below:

06.15.05 (Date) Kathy Llanas (Signature)

Mail Stop Appeal Brief – Patents
Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellant hereby submits this Appeal Brief to the Board of Patent Appeals and Interferences in response to the final Office Action dated March 10, 2005. A Notice of Appeal was filed on June 7, 2005 and so this Appeal Brief is believed to be timely filed.

A check in the amount of $500.00 as cost to file this Appeal Brief is attached. If the check is inadvertently omitted, the Assistant Commissioner is authorized to deduct the fee for filing this Appeal Brief ($500) from **Williams, Morgan & Amerson's P.C. Deposit Account 50-0786/2008.002800.**

06/20/2005 MAHMED1 00000011 09589055
01 FC:1402 500.00 OP

I. REAL PARTY IN INTEREST

The present application is owned by Micron Technology, Inc. The assignment of the present application to Micron Technology, Inc., is recorded at Reel 10846, Frame 0582.

II. RELATED APPEALS AND INTERFERENCES

Appellant is not aware of any related appeals and/or interferences that might affect the outcome of this proceeding.

III. STATUS OF THE CLAIMS

Claims 16-37 and 48-54 are pending in the present application. Claims 16-37 and 53-54 stand rejected under 35 USC 1112, first paragraph, as allegedly failing to comply with the written description requirement. Claims 16-19, 21, 23-31, 33, 35-37, 48, 50, and 52-54 stand rejected under 35 U.S.C. §102(b) as being anticipated by Spiegel, et al (U.S. Patent No. 3,763,051). Claims 16-19, 21, 23-31, 33, 35-37, 48, 50, and 52-54 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel in view of Dinh (U.S. Patent No. 6,214,419). Claims 20, 32, and 49 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel in view of Unnai, et al (U.S. Patent No. 4,293,586). Claims 20, 32, and 49 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel in view of Dinh and further in view of Unnai. Claims 22, 34, and 51 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel in view of Kim et al. (U.S. Patent No. 5,723,070). Claims 22, 34, and 51 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel and Dinh in view of Kim Claims 26-27 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel in view of any one of Mohacsi (U.S. Patent No. 5,200,233), Dahlquist, et al (U.S. Patent No. 5,569,485), Higton, et

al (U.S. Patent No. 4,365,184), or Bryan et al (U.S. Patent No. 4,983,847). Claims 26-27 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel in view of Dinh and further in view of any one of Mohacsi, Dahlquist, Higton, or Bryan. Claims 26 and 28 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel in view of Mohacsi or Dahlquist and further in view of Rabatin (U.S. Patent No. 3,617,743). Claims 26 and 28 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel in view of Dinh or Mohacsi or Dahlquist and further in view of Rabatin. Claims 26 and 29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel in view of Mohacsi, Dahlquist, or Higton. Claims 26 and 29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel in view of Dinh, Mohacsi, Dahlquist, or Higton. Claim 30 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel in view of Higton, Bryan, and Rabatin. Claim 30 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel in view of Dinh and further in view of Higton, Bryan, and Rabatin.

IV. STATUS OF AMENDMENTS

There were no amendments after the final rejections.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 16 sets forth a phosphor particle bounded substrate formed by a method that includes applying phosphor particles to the substrate, immersing the substrate into a binder solution, and removing the substrate from the binder solution at a predetermined rate. In one exemplary embodiment of the present invention, phosphor particles are applied to a faceplate 110. The faceplate 110 is then submerged into a binder solution and removed at a predetermined

rate. See Patent Application, page 9, ll. 1-9 and Figure 1. Alternatively, the faceplate 110 may be lowered vertically into the binder solution (*e.g.*, Patent Application, page 10, ll. 10-24 and Figure 2) or may be dipped vertically into the binder solution (*e.g.*, Patent Application, page 11, ll. 11-20 and Figure 3) before being withdrawn at a predetermined rate.

Independent claim 31 sets forth a phosphor particle bounded substrate that includes a substrate having first and second surfaces, an anode electrode formed on the first surface of the substrate, and a fluorescent material layer (FML) formed on the anode electrode. The FML has phosphor particles disposed therein and the phosphor particles are bound to the substrate by immersing the substrate into a binder solution and removing the substrate from the binder solution at a predetermined rate. Figure 1 shows one exemplary embodiment of a faceplate 110 that includes an anode electrode 120 formed on a first surface of the faceplate 110 and a fluorescent material layer 130 formed on at the anode electrode 120. See Patent Application, page 6, ll. 15-16 and page 7, ll. 14-16. The phosphor particles are bound to the substrate by submerging the faceplate 110 in a binder solution and removing a faceplate 110 at a predetermined rate. See Patent Application, page 9, ll. 1-9 and Figure 1. Alternatively, the faceplate 110 may be lowered vertically into the binder solution (*e.g.*, Patent Application, page 10, ll. 10-24 and Figure 2) or may be dipped vertically into the binder solution (*e.g.*, Patent Application, page 11, ll. 11-20 and Figure 3) before being withdrawn at a predetermined rate.

Independent claim 48 sets forth substrate that includes an anode electrode formed on a first surface of the substrate and a fluorescent material layer (FML) formed on the anode electrode. The FML includes phosphor particles bound to the anode electrode by removing the substrate from a binder solution at a predetermined rate. Figure 1 shows one exemplary embodiment of a faceplate 110 that includes an anode electrode 120 formed on a first surface of

the faceplate 110 and a fluorescent material layer 130 formed on at the anode electrode 120. See Patent Application, page 6, ll. 15-16 and page 7, ll. 14-16. The phosphor particles are bound to the substrate by removing the faceplate 110 from a binder solution at a predetermined rate. See Patent Application, page 9, ll. 1-9 and Figure 1.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellant respectfully requests that the Board review and overturn the fifteen rejections present in this case. The following issues are presented on appeal in this case:

(A) Whether claims 16-37 and 53-54 comply with the written description requirement;

(B) Whether claims 16-19, 21, 23-31, 33, 35-37, 48, 50, and 52-54 are anticipated by Spiegel;

(C) Whether claims 16-19, 21, 23-31, 33, 35-37, 48, 50, and 52-54 are obvious over Spiegel in view of Dinh;

(D) Whether claims 20, 32, and 49 are obvious over Spiegel in view of Unnai;

(E) Whether claims 20, 32, and 49 are obvious over Spiegel in view of Dinh and further in view of Unnai;

(F) Whether claims 22, 34, and 51 are obvious over Spiegel in view of Kim;

(G) Whether claims 22, 34, and 51 are obvious over Spiegel and Dinh in view of Kim;

(H) Whether claims 26-27 are obvious over Spiegel in view of any one of Mohacsi (U.S. Patent No. 5,200,233), Dahlquist, Higton, or Bryan;

(I) Whether Claims 26-27 are obvious over Spiegel in view of Dinh and further in view of any one of Mohacsi, Dahlquist, Higton, or Bryan;

(J) Whether claims 26 and 28 are obvious over Spiegel in view of Mohacsi or Dahlquist and further in view of Rabatin;

(K) Whether claims 26 and 28 are obvious over Spiegel in view of Dinh or Mohacsi or Dahlquist and further in view of Rabatin;

(L) Whether claims 26 and 29 are obvious over Spiegel in view of Mohacsi, Dahlquist, or Higton;

(M) Whether claims 26 and 29 are obvious over Spiegel in view of Dinh, Mohacsi, Dahlquist, or Higton;

(N) Whether claim 30 is obvious over Spiegel in view of Higton, Bryan, and Rabatin; and

(O) Whether claim 30 is obvious over Spiegel in view of Dinh and further in view of Higton, Bryan, and Rabatin.

VII. ARGUMENT

A. Legal Standards

The test for determining compliance with the written description requirement is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter, rather than the presence or absence of literal support in the specification for the claim language. *In re Edwards*, 558 [568] F.2d 1349, 196 USPQ 465 (CCPA 1978); *In re Herschler*, 591 F.2d 693, 200 USPQ 711 (CCPA 1979); *In re Kaslow*, 707 F.2d 1366, 217 USPQ 1089 (Fed. Cir. 1983). The content of the drawings may also be considered in determining compliance with the written description

requirement. *In re Barker*, 559 F.2d 588, 194 USPQ 470 (CCPA 1977); *In re Kaslow*, 707 F.2d 1366, 217 USPQ 1089 (Fed. Cir. 1983).

An anticipating reference by definition must disclose every limitation of the rejected claim in the same relationship to one another as set forth in the claim. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. That is, there must be something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561 (Fed. Cir. 1986). In fact, the absence of a suggestion to combine is dispositive in an obviousness determination. *Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573 (Fed. Cir. 1997). The mere fact that the prior art can be combined or modified does not make the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990); M.P.E.P. § 2143.01. Third, there must be a reasonable expectation of success.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991); M.P.E.P. § 2142. A recent Federal Circuit case emphasizes that, in an obviousness situation, the prior art must disclose each and every element of the claimed invention, and that any motivation to combine or

modify the prior art must be based upon a suggestion in the prior art. *In re Lee*, 61 U.S.P.Q.2d 143 (Fed. Cir. 2002). Conclusory statements regarding common knowledge and common sense are insufficient to support a finding of obviousness. *Id.* at 1434-35. Moreover, it is the claimed invention, as a whole, that must be considered for purposes of determining obviousness. A mere selection of various bits and pieces of the claimed invention from various sources of prior art does not render a claimed invention obvious, unless there is a suggestion or motivation in the prior art for the claimed invention, when considered as a whole.

It is by now well established that teaching away by the prior art constitutes *prima facie* evidence that the claimed invention is not obvious. *See, inter alia, In re Fine,* 5 U.S.P.Q.2d (BNA) 1596, 1599 (Fed. Cir. 1988); *In re Nielson*, 2 U.S.P.Q.2d (BNA) 1525, 1528 (Fed. Cir. 1987); *In re Hedges*, 228 U.S.P.Q. (BNA) 685, 687 (Fed. Cir. 1986).

B. Claims 16-37 and 53-54 comply with the written description requirement.

The Examiner alleges that claims 16-37 and 53-54 contain subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. In particular, the Examiner alleges that the specification lacks support for the term "immersing." The Examiner also alleges that the difference between "immersing" and "submerging" is significant because the rate of inserting and/or removing the substrate from a binder solution directly affects the strength at which the phosphor particles are bound to the substrate. However, Appellants respectfully disagree and submit that the dictionary definitions provided by the Examiner fail to support the Examiner's conclusion that the terms "immersing" and "submerging" imply different rates of immersion and/or submersion. To the contrary, the

dictionary definitions provided by the Examiner are completely silent with regard to any particular rate of immersion and/or submersion, in accordance with common usage in the art.

Moreover, Appellants respectfully submit that there is no statutory requirement for a one-to-one correspondence between the words used to describe the invention and the words used to claim the invention. To the contrary, as stated above, the test for determining compliance with the written description requirement is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter, rather than the presence or absence of literal support in the specification for the claim language. Appellants further submit that the specification describes embodiments of the present invention that include *submerging* a faceplate 110 in a binder solution (*e.g.*, Patent Application, page 9, ll. 1-9 and Figure 1), *lowering* the faceplate 110 vertically into the binder solution (*e.g.*, Patent Application, page 10, ll. 10-24 and Figure 2), and *dipping* the faceplate 110 vertically into the binder solution (*e.g.*, Patent Application, page 11, ll. 11-20 and Figure 3). Appellants submit that any of these embodiments, as well as the combination of these embodiments, provides adequate support for "immersing" the substrate in the binder solution. Thus, Appellants submit that the invention set forth in claims 16-37 and 53-54 was described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Appellants respectfully request that the Examiner's rejection of claims 16-37 and 53-54 under 35 USC 112, first paragraph, be REVERSED.

C. **Claims 16-19, 21, 23-31, 33, 35-37, 48, 50, and 52-54 are not anticipated by Spiegel.**

Spiegel teaches a dip-coating process in which a thin, even layer of suspension is formed on a flat flexible surface by dipping a strip of vinyl sheet into a suspension, draining vertically for one minute, then placing the vinyl down upon a flat laboratory bench. The viscosity, surface tension, and drain time combine to produce a reproducible thin layer of suspension on the vinyl sheet. The metallic segments to be coated are then pressed down on the suspension, lifted, and allowed to dry. See Spiegel, col. 2, ll. 22-38.

Appellants respectfully submit that the process taught by Spiegel is completely different than the processes described in the present application. In particular, Spiegel does not describe or suggest that the substrate to which the phosphor is to be bound should be immersed in the binder solution. To the contrary, as discussed above, Spiegel teaches that a vinyl sheet should be immersed in a suspension and then the metallic segment to be coated, *i.e.* the substrate, is pressed down on the thin layer of suspension formed on the vinyl sheet. Furthermore, as admitted by the Examiner, Spiegel fails to teach withdrawing the vinyl sheet from the binder solution at a predetermined rate.

Even though the Examiner admits that the process used by Spiegel differs from the processes described in the present application, the Examiner maintains that the product formed by the process described in the Spiegel is identical to or only slightly different than the claimed article. In particular, the Examiner alleges in the Final Office Action, that the vinyl sheet is a substrate and thus the product formed by dipping the vinyl sheet into the suspension, as described by Speigel, forms a product that is indistinguishable from the product formed according to the present invention.

Appellants respectfully disagree for at least the following reasons. As discussed above, Appellants believe that the Examiner has misinterpreted Spiegel and that Spiegel does not describe bonding phosphor to a substrate by immersing the substrate into a phosphor binder solution, as alleged by the Examiner. As discussed above, Spiegel describes immersing a vinyl sheet in a suspension and then pressing a metallic segment down on the thin layer of suspension formed on the vinyl sheet. However, phosphor particles in the suspension described by Speigel are not bonded to the vinyl sheet, thus the vinyl sheet cannot be equated to the substrate set forth in the present invention. To the contrary, Spiegel teaches that the suspension should not be bonded to the vinyl sheet so that the suspension may adhere to the metallic segment when the metallic segment is pressed down on the vinyl sheet.

Furthermore, Appellants respectfully submit that the products formed by the processes set forth in independent claims 16, 31, and 48 are not the same or an obvious variation of the products described in the prior art of record. Appellants respectfully submit that immersing a substrate in the binder solution and then removing the substrate from the binder solution at a predetermined rate causes the phosphor particles disposed on the substrate to bind stronger to each other and to the substrate itself. Accordingly, because the phosphor particles are bound stronger to each other and to the substrate as a result of the process of removing the substrate from the binder solution at a predetermined rate, it is respectfully submitted that the phosphor particle bounded substrate of the present invention has a structure that is distinct from the structure of the phosphor-coated metallic segments described in Spiegel.

Accordingly, Appellants respectfully submit that these claims cannot be anticipated by Spiegel because the particle bound substrate of the present invention, as defined by claims 16,

31, and 48 (and all claims dependent thereon), is a different product from the phosphor-coated faceplate of Spiegel as a result of the phosphor binding process of the present invention.

For at least the aforementioned reasons, Appellants respectfully request that the Examiner's rejections of claims 16-19, 21, 23-31, 33, 33-37, 48, 50, and 52-54 under 35 U.S.C. 102(b) be REVERSED.

D. Claims 16-19, 21, 23-31, 33, 35-37, 48, 50, and 52-54 are not obvious over Spiegel in view of Dinh.

As discussed above, Spiegel fails to teach or suggest many of the steps set forth in independent claims 16, 31, and 48 and therefore the product formed by the techniques described in Spiegel differs from the claimed products. In particular, Spiegel fails to teach or suggest forming a phosphor bounded substrate by immersing the substrate into a binder solution. Furthermore, as admitted by the Examiner, Spiegel fails to teach or suggest selecting a removal rate of the substrate from the binder solution. The Examiner relies upon Dinh to teach that a coating thickness generally increases with the coating material concentration and with the take-up speed. See Dinh, col. 1, ll. 37-47 and col. 6, ll. 14-20. The Examiner that alleges that it would have been obvious to vary the take-up speed of the vinyl sheet described by Spiegel based on a desired coaching thickness, as taught by Dinh.

Appellants respectfully disagree and submit that the prior art of record provides no suggestion or motivation to combine and/or modify the teachings of Spiegel and Dinh to arrive at Appellants claimed invention. In particular, Appellants respectfully submit that neither Spiegel nor Dinh teach that any particular thickness of the coating on the vinyl sheet described by Spiegel is desirable. Thus, contrary to the Examiner's allegation, the prior art of record provides

no teaching or suggestion to vary the take-up speed of the vinyl sheet to vary the thickness of the coating on the vinyl sheet. Moreover, Spiegel provides no suggestion or teaching that the thickness of the layer of coating formed on the metallic segment is in any way related to the thickness of the coating formed on the vinyl sheet.

Appellants also submit that Spiegel teaches away from the claimed invention. As discussed above, Spiegel teaches that a vinyl sheet should be immersed in a suspension and then the metallic segments to be coated, *i.e.* the substrate, are pressed down on the thin layer of suspension formed on the vinyl sheet. Applicants submit that Spiegel's teaching that the vinyl sheet should be immersed in the suspension and then the substrate pressed down upon the suspension teaches away from immersing the substrate in the suspension, as set forth in independent claims 16, 31, and 48. Spiegel also teaches away from binding phosphor to the vinyl sheet by teaching that the suspension should *not* be bonded to the vinyl sheet so that the suspension may adhere to the metallic segment when the metallic segment is pressed down on the vinyl sheet.

For at least the aforementioned reasons, Appellants respectfully submit that the Examiner has failed to make a *prima facie* case that the present invention is obvious over Spiegel and Dinh, either alone or in combination. Appellants request that the Examiner's rejections of claims 16-19, 21, 23-31, 33, 33-37, 48, 50, and 52-54 under 35 U.S.C. 103(a) be REVERSED.

E. Claims 20, 32, and 49 are not obvious over Spiegel in view of Unnai.

Claims 20, 32, and 49 depend from independent claims 16, 31, and 38, respectively. As discussed above, Spiegel fails to teach or suggest many of the steps set forth in independent claims 16, 31, and 48. To the contrary, Spiegel appears to teach away from the present

invention. The Examiner relies on Unnai to describe particular potassium weight percentage ranges. However, Unnai fails to remedy the aforementioned fundamental deficiencies of Spiegel. Thus, for at least the reasons discussed above with regard to independent claims 16, 31, and 48, Appellants respectfully submit that the Examiner has failed to make a *prima facie* case that claims 20, 32, and 49 are obvious over Spiegel in view of Unnai.

Appellants request that the Examiner's rejections of claims 20, 32, and 49 under 35 U.S.C. 103(a) be REVERSED.

F. Claims 20, 32, and 49 are not obvious over Spiegel in view of Dinh and further in view of Unnai.

Claims 20, 32, and 49 depend from independent claims 16, 31, and 38, respectively. As discussed above, Spiegel and Dinh fail to teach or suggest many of the steps set forth in independent claims 16, 31, and 48. To the contrary, Spiegel appears to teach away from the present invention. The Examiner relies on Unnai to describe particular potassium weight percentage ranges. However, Unnai fails to remedy the aforementioned fundamental deficiencies of Spiegel and Dinh. Thus, for at least the reasons discussed above with regard to independent claims 16, 31, and 48, Appellants respectfully submit that the Examiner has failed to make a *prima facie* case that claims 20, 32, and 49 are obvious over Spiegel in view of Unnai.

Appellants request that the Examiner's rejections of claims 20, 32,and 49 under 35 U.S.C. 103(a) be REVERSED.

G. Claims 22, 34, and 51 are not obvious over Spiegel in view of Kim.

Claims 22, 34, and 51 depend from independent claims 16, 31, and 38, respectively. As discussed above, Spiegel fails to teach or suggest many of the steps set forth in independent claims 16, 31, and 48. To the contrary, Spiegel appears to teach away from the present invention. The Examiner relies on Kim to describe organo silicates. However, Kim fails to remedy the aforementioned fundamental deficiencies of Spiegel. Thus, for at least the reasons discussed above with regard to independent claims 16, 31, and 48, Appellants respectfully submit that the Examiner has failed to make a *prima facie* case that claims 22, 34, and 51 are obvious over Spiegel in view of Kim.

Appellants request that the Examiner's rejections of claims 22, 34, and 51 under 35 U.S.C. 103(a) be REVERSED.

H. Claims 22, 34, and 51 are not obvious over Spiegel and Dinh in view of Kim.

Claims 22, 34, and 51 depend from independent claims 16, 31, and 38, respectively. As discussed above, Spiegel and Dinh fail to teach or suggest many of the steps set forth in independent claims 16, 31, and 48. To the contrary, Spiegel appears to teach away from the present invention. The Examiner relies on Kim to describe organo silicates. However, Kim fails to remedy the aforementioned fundamental deficiencies of Spiegel and Dinh. Thus, for at least the reasons discussed above with regard to independent claims 16, 31, and 48, Appellants respectfully submit that the Examiner has failed to make a *prima facie* case that claims 22, 34, and 51 are obvious over Spiegel and Dinh in view of Kim.

Appellants request that the Examiner's rejections of claims 22, 34, and 51 under 35 U.S.C. 103(a) be REVERSED.

I. Claims 26-27 are not obvious over Spiegel in view of any one of Mohacsi, Dahlquist, Higton, or Bryan.

Claims 26-27 depend from independent claim 16. As discussed above, Spiegel fails to teach or suggest many of the steps set forth in independent claim 16. To the contrary, Spiegel appears to teach away from the present invention. The Examiner relies on Mohacsi, Dahlquist, Higton, and/or Bryan to describe glycerol and indium nitrate electrolyte. However, Mohacsi, Dahlquist, Higton, and Bryan fail to remedy the aforementioned fundamental deficiencies of Spiegel. Thus, for at least the reasons discussed above with regard to independent claim 16, Appellants respectfully submit that the Examiner has failed to make a *prima facie* case that claims 26-27 are obvious over Spiegel in view of Mohacsi, Dahlquist, Higton, and/or Bryan.

Appellants request that the Examiner's rejections of claims 26-27 under U.S.C. 103(a) be REVERSED.

J. Claims 26-27 are not obvious over Spiegel in view of Dinh and further in view of Mohacsi, Dahlquist, Higton, or Bryan.

Claims 26-27 depend from independent claim 16. As discussed above, Spiegel and Dinh fail to teach or suggest many of the steps set forth in independent claim 16. To the contrary, Spiegel appears to teach away from the present invention. The Examiner relies on Mohacsi, Dahlquist, Higton, and/or Bryan to describe glycerol and indium nitrate electrolyte. However, Mohacsi, Dahlquist, Higton, and Bryan fail to remedy the aforementioned fundamental deficiencies of Spiegel and Dinh. Thus, for at least the reasons discussed above with regard to independent claim 16, Appellants respectfully submit that the Examiner has failed to make a

prima facie case that claims 26-27 are obvious over Spiegel and Dinh in view of Mohacsi, Dahlquist, Higton, and/or Bryan.

Appellants request that the Examiner's rejections of claims 26-27 under U.S.C. 103(a) be REVERSED.

K. Claims 26 and 28 are not obvious over Spiegel in view of Mohacsi or Dahlquist and further in view of Rabatin.

Claims 26 and 28 depend from independent claim 16. As discussed above, Spiegel fails to teach or suggest many of the steps set forth in independent claim 16. To the contrary, Spiegel appears to teach away from the present invention. The Examiner relies on Mohacsi and Dahlquist to describe glycerol and Rabatin to describe cerium nitrate electrolyte. However, Mohacsi, Dahlquist, and Rabatin fail to remedy the aforementioned fundamental deficiencies of Spiegel. Thus, for at least the reasons discussed above with regard to independent claim 16, Appellants respectfully submit that the Examiner has failed to make a *prima facie* case that claims 26 and 28 are obvious over Spiegel in view of Mohacsi, Dahlquist, and Rabatin.

Appellants request that the Examiner's rejections of claims 26 and 28 under U.S.C. 103(a) be REVERSED.

L. Claims 26 and 28 are not obvious over Spiegel in view of Dinh or Mohacsi or Dahlquist and further in view of Rabatin.

Claims 26 and 28 depend from independent claim 16. As discussed above, Spiegel and Dinh fail to teach or suggest many of the steps set forth in independent claim 16. To the contrary, Spiegel appears to teach away from the present invention. The Examiner relies on

Mohacsi and Dahlquist to describe glycerol and Rabatin to describe cerium nitrate electrolyte. However, Mohacsi, Dahlquist, and Rabatin fail to remedy the aforementioned fundamental deficiencies of Spiegel and Dinh. Thus, for at least the reasons discussed above with regard to independent claim 16, Appellants respectfully submit that the Examiner has failed to make a *prima facie* case that claims 26 and 28 are obvious over Spiegel and Dinh in view of Mohacsi, Dahlquist, and Rabatin.

Appellants request that the Examiner's rejections of claims 26 and 28 under U.S.C. 103(a) be REVERSED.

M. Claims 26 and 29 are not obvious over Spiegel in view of Mohacsi, Dahlquist, or Higton.

Claims 26 and 29 depend from independent claim 16. As discussed above, Spiegel fails to teach or suggest many of the steps set forth in independent claim 16. To the contrary, Spiegel appears to teach away from the present invention. The Examiner relies on Mohacsi and Dahlquist to describe glycerol and Higton to describe thorium. However, Mohacsi, Dahlquist, and Higton fail to remedy the aforementioned fundamental deficiencies of Spiegel. Thus, for at least the reasons discussed above with regard to independent claim 16, Appellants respectfully submit that the Examiner has failed to make a *prima facie* case that claims 26 and 29 are obvious over Spiegel in view of Mohacsi, Dahlquist, and Higton.

Appellants request that the Examiner's rejections of claims 26 and 29 under U.S.C. 103(a) be REVERSED.

N. **Claims 26 and 29 are not obvious over Spiegel in view of Dinh, Mohacsi, Dahlquist, or Higton.**

Claims 26 and 29 depend from independent claim 16. As discussed above, Spiegel and Dinh fail to teach or suggest many of the steps set forth in independent claim 16. To the contrary, Spiegel appears to teach away from the present invention. The Examiner relies on Mohacsi and Dahlquist to describe glycerol and Higton to describe thorium. However, Mohacsi, Dahlquist, and Higton fail to remedy the aforementioned fundamental deficiencies of Spiegel and Dinh. Thus, for at least the reasons discussed above with regard to independent claim 16, Appellants respectfully submit that the Examiner has failed to make a *prima facie* case that claims 26 and 29 are obvious over Spiegel and Dinh in view of Mohacsi, Dahlquist, and Higton.

Appellants request that the Examiner's rejections of claims 26 and 29 under U.S.C. 103(a) be REVERSED.

O. **Claim 30 is not obvious over Spiegel in view of Higton, Bryan, and Rabatin.**

Claim 30 depends from independent claim 16. As discussed above, Spiegel fails to teach or suggest many of the steps set forth in independent claim 16. To the contrary, Spiegel appears to teach away from the present invention. The Examiner relies on Higton, Bryan, and Rabatin to describe electrolytes. However, Higton, Bryan, and Rabatin fail to remedy the aforementioned fundamental deficiencies of Spiegel. Thus, for at least the reasons discussed above with regard to independent claim 16, Appellants respectfully submit that the Examiner has failed to make a *prima facie* case that claim 30 is obvious over Spiegel in view of Higton, Bryan, and Rabatin.

Appellants request that the Examiner's rejection of claim 30 under U.S.C. 103(a) be REVERSED.

P. **Claim 30 is not obvious over Spiegel in view of Dinh and further in view of Higton, Bryan, and Rabatin.**

Claim 30 depends from independent claim 16. As discussed above, Spiegel and Dinh fail to teach or suggest many of the steps set forth in independent claim 16. To the contrary, Spiegel appears to teach away from the present invention. The Examiner relies on Higton, Bryan, and Rabatin to describe electrolytes. However, Higton, Bryan, and Rabatin fail to remedy the aforementioned fundamental deficiencies of Spiegel and Dinh. Thus, for at least the reasons discussed above with regard to independent claim 16, Appellants respectfully submit that the Examiner has failed to make a *prima facie* case that claim 30 is obvious over Spiegel and Dinh in view of Higton, Bryan, and Rabatin.

Appellants request that the Examiner's rejection of claim 30 under U.S.C. 103(a) be REVERSED.

VIII. CLAIMS APPENDIX

The claims that are the subject of the present appeal – claims 16-37 and 48-54 – are set forth in the attached "Claims Appendix."

IX. EVIDENCE APPENDIX

There is no separate Evidence Appendix for this appeal.

X. RELATED PROCEEDINGS APPENDIX

There is no Related Proceedings Appendix for this appeal.

XI. CONCLUSION

In view of the foregoing, it is respectfully submitted that the Examiner erred in not allowing all claims pending in the present application, claims 16-37 and 48-54, over the prior art of record. The undersigned may be contacted at (713) 934-4052 with respect to any questions, comments or suggestions relating to this appeal.

Respectfully submitted,

Date: 6-15-05

Danny L. Williams
Reg. No. 31,892
WILLIAMS, MORGAN & AMERSON
10333 Richmond, Suite 1100
Houston, Texas 77042
(713) 934-7000
(713) 934-7011 (facsimile)

ATTORNEY FOR APPELLANTS

CLAIMS APPENDIX

1. (Withdrawn) A method, comprising:

applying phosphor particles to a substrate;

submerging the substrate into a binder solution; and

removing the substrate from the binder solution at a predetermined rate.

2. (Withdrawn) The method of claim 1, wherein removing the substrate from the binder solution at a predetermined rate further comprises:

removing the substrate from the binder solution at a rate of about one inch per minute.

3. (Withdrawn) The method of claim 1, further comprising:

placing the substrate into a furnace to fire the substrate.

4. (Withdrawn) The method of claim 1, wherein submerging the substrate into the binder solution, further comprises:

submerging the substrate into a solution of potassium silicate and water.

5. (Withdrawn) The method of claim 4, wherein submerging the substrate into a solution of potassium silicate and water, further comprises:

submerging the substrate into a solution of about 0.1 to 2.0% by weight of potassium silicate dissolved in water.

6. (Withdrawn) The method of claim 1, wherein submerging the substrate into the binder solution, further comprises:

submerging the substrate into a solution containing water and at least one of potassium silicate, sodium silicate, ammonium silicate and polyvinyl alcohol.

7. (Withdrawn) The method of claim 1, wherein submerging the substrate into the binder solution, further comprises:

submerging the substrate into a solution containing alcohol and organo-silicate.

8. (Withdrawn) The method of claim 3, wherein placing the substrate into a furnace to fire the substrate, further comprises:

placing the substrate into a furnace to heat the substrate to a temperature between about 400° and 700°C.

9. (Withdrawn) The method of claim 3, wherein placing the substrate into a furnace to fire the substrate, further comprises:

placing the substrate into a furnace to heat the substrate to a tempurature between about 400° and 500° C.

10. (Withdrawn) The method of claim 1, wherein applying phosphor particles to a substrate, further comprises:

submerging the substrate in a non-aqueous solution with dispersed phosphor particles.

11. (Withdrawn) The method of claim 10, wherein submerging the substrate in a non-aqueous solution with dispersed phosphor particles, further comprises:

submerging the substrate in an isopropyl alcohol solution with dispersed phosphor particles, an electrolyte and glycerol.

12. (Withdrawn) The method of claim 11, wherein submerging the substrate in an isopropyl alcohol solution with dispersed phosphor particles and an electrolyte, further comprises:

submerging the substrate in an isopropyl alcohol solution with dispersed phosphor particles and indium nitrate.

13. (Withdrawn) The method of claim 11, wherein submerging the substrate in an isopropyl alcohol solution with dispersed phosphor particles and an electrolyte, further comprises:

submerging the substrate in an isopropyl alcohol solution with dispersed phosphor particles and cerium nitrite.

14. (Withdrawn) The method of claim 11, wherein submerging the substrate in an isopropyl alcohol solution with dispersed phosphor particles and an electrolyte, further comprises:

submerging the substrate in an isopropyl alcohol solution with dispersed phosphor particles and thorium nitrate.

15. (Withdrawn) The method of claim 10, wherein submerging the substrate in a non-aqueous solution with dispersed phosphor particles, further comprises:

adding an electrolyte to the non-aqueous solution; and

applying a voltage to the substrate and a counter electrode.

16. (Previously Presented) A phosphor particle bounded substrate formed by a method comprising:

applying phosphor particles to the substrate;

immersing the substrate into a binder solution; and

removing the substrate from the binder solution at a predetermined rate.

17. (Original) The substrate of claim 16, wherein removing the substrate from the binder solution at a predetermined rate further comprises:

removing the substrate from the binder solution at a rate of about one inch per minute.

18. (Original) The substrate of claim 16, further comprising:

placing the substrate into a furnace to fire the substrate.

19. (Previously Presented) The substrate of claim 16, wherein immersing the substrate into the binder solution, further comprises:

immersing the substrate into a solution of potassium silicate and water.

20. (Previously Presented) The substrate of claim 19, wherein immersing the substrate into a solution of potassium silicate and water, further comprises:

immersing the substrate into a solution of about 0.1 to 0.5% by weight of potassium silicate dissolved in water.

21. (Previously Presented)) The substrate of claim 16, wherein immersing the substrate into the binder solution, further comprises:

immersing the substrate into a solution containing water and at least one of potassium silicate, sodium silicate, ammonium silicate and polyvinyl alcohol.

22. (Previously Presented) The substrate of claim 16, wherein immersing the substrate into the binder solution, further comprises:

immersing the substrate into a solution containing alcohol and organo-silicate.

23. (Original) The substrate of claim 18, wherein placing the substrate into a furnace to fire the substrate, further comprises:

placing the substrate into a furnace to heat the substrate to a temperature between about 400° and 700°C.

24. (Previously Presented) The substrate of claim 16, where in immersing the substrate into the binder solution, further comprises:

placing the substrate into a furnace to heat the substrate to a temperature between about 400° and 500°C.

25. (Original) The substrate of claim 16, wherein applying phosphor particles to a substrate, further comprises:

submerging the substrate in a non-aqueous solution with dispersed phosphor particles.

26. (Previously Presented) The substrate of claim 25, wherein immersing the substrate in a non-aqueous solution with dispersed phosphor particles, further comprises:

immersing the substrate in an isopropyl alcohol solution with dispersed phosphor particles, an electrolyte and glycerol.

27. (Previously Presented) The substrate of claim 26, wherein immersing the substrate in an isopropyl alcohol solution with dispersed phosphor particles and an electrolyte, further comprises:

immersing the substrate in an isopropyl alcohol solution with dispersed phosphor particles and indium nitrate.

28. (Previously Presented) The substrate of claim 26, wherein immersing the substrate in an isopropyl alcohol solution with dispersed phosphor particles and an electrolyte, further comprises:

immersing the substrate in an isopropyl alcohol solution with dispersed phosphor particles and cerium nitrate.

29. (Previously Presented) The substrate of claim 26, wherein immersing the substrate in an isopropyl alcohol solution with dispersed phosphor particles and an electrolyte, further comprises:

immersing the substrate in an isopropyl alcohol solution with dispersed phosphor particles and thorium nitrate.

30. (Previously Presented) The substrate of claim 25, wherein immersing the substrate in a non-aqueous solution with dispersed phosphor particles, further comprises:

adding an electrolyte to the non-aqueous solution; and

applying a voltage to the substrate and a counter electrode.

31. (Previously Presented) A phosphor particle bounded substrate, comprising:

a substrate having first and second surfaces;

an anode electrode formed on the first surface of the substrate;

a fluorescent material layer (FML) formed on the anode electrode, the FML having phosphor particles disposed therein;

wherein the phosphor particles are bound to the substrate by immersing the substrate into a binder solution and removing the substrate from the binder solution at a predetermined rate.

32. (Original) The phosphor particle bounded substrate of claim 31, wherein the binder solution comprises a solution of approximately 0.1%-2.0 % by body weight potassium silicate in water.

33. (Original) The phosphor particle bounded substrate of claim 31, wherein the binder solution comprises water and at least one of potassium silicate, sodium silicate, ammonium silicate and polyvinyl alcohol.

34. (Original) The phosphor particle bounded substrate of claim 31, wherein the binder solution comprises alcohol and organo-silicate.

35. (Original) The phosphor particle bounded substrate of claim 31, wherein the predetermined rate is approximately one inch per minute.

36. (Previously Presented) The phosphor particle bounded substrate of claim 31, wherein the phosphor particles are bound to the substrate by immersing the substrate into a binder solution, removing the substrate from the binder solution at a predetermined rate, and placing the substrate into a furnace to heat the substrate to a temperature between about 400° and 700° C.

37. (Original) The phosphor particle bounded substrate of claim 36, wherein the substrate is heated to a temperature between about 400° and 500° C.

38. (Withdrawn) A system for binding phosphor particles to a substrate, comprising:

a first bath containing a non-aqueous solution with phosphor particles dispensed therein, the first bath for receiving the substrate to be immersed in the non-aqueous solution;

a power supply coupled to the substrate when the substrate is immersed in the non-aqueous solution, and to a counter electrode;

a binder solution;

a second bath containing the binder solution, the second bath enabling submersion of the substrate into the binder solution; and

a furnace for heating the substrate.

39. (Withdrawn) The system of claim 38, wherein the non-aqueous solution comprises phosphor and isopropyl alcohol solution and an electrolyte.

40. (Withdrawn) The system of claim 39, wherein the electrolyte comprises indium nitrate.

41. (Withdrawn) The system of claim 39, wherein the electrolyte comprises cerium nitrate.

42. (Withdrawn) The system of claim 39, wherein the electrolyte comprises thorium nitrate.

43. (Withdrawn) The system of claim 38, wherein the binder solution comprises about 0.1%-2.0% by weight potassium silicate in water.

44. (Withdrawn) The system of claim 38, wherein the binder solution comprises water and at least one of potassium silicate, sodium silicate, ammonium silicate and polyvinyl alcohol.

45. (Withdrawn) The system of claim 38, wherein the binder solution comprises alcohol and organo-silicate.

46. (Withdrawn) The system of claim 38, wherein the furnace hears the substrate to a temperature between about 400° and 700° C.

47. (Withdrawn) The system of claim 38, wherein the furnace heats the substrate to a temperature between about 400° and 500° C.

48. (Previously presented) A substrate, comprising:

an anode electrode formed on a first surface of the substrate; and

a fluorescent material layer (FML) formed on the anode electrode, the FML having phosphor particles that are bound to the anode electrode by removing the substrate from a binder solution at a predetermined rate.

49. (Previously presented) The substrate of claim 48, wherein the binder solution comprises a solution of approximately 0.1%-2.0 % by body weight potassium silicate in water.

50. (Previously presented) The substrate of claim 48, wherein the binder solution comprises water and at least one of potassium silicate, sodium silicate, ammonium silicate and polyvinyl alcohol.

51. (Previously presented) The substrate of claim 48, wherein the binder solution comprises alcohol and organo-silicate.

52. (Previously presented) The substrate of claim 48, wherein the predetermined rate is approximately one inch per minute.

53. (Previously Presented) The substrate of claim 48, wherein the phosphor particles are bound to the substrate by immersing the substrate into a binder solution, removing the substrate from the binder solution at a predetermined rate, and placing the substrate into a furnace to heat the substrate to a temperature between about 400° and 700° C.

54. (Previously presented) The substrate of claim 53, wherein the substrate is heated to a temperature between about 400° and 500° C.